

PRIMARY VERSUS SECONDARY CALLOUSNESS AMONG JUVENILE JUSTICE-
INVOLVED YOUTH: INVESTIGATING DIFFERENCES IN EMOTION
REGULATION

by

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ABSTRACT

This study compared difficulties in emotion regulation among primary, secondary, and low callous-unemotional (CU) youth in a sample of 417 detained adolescents (306 boys, 111 girls). Mixture modeling on the basis of posttraumatic stress disorder (PTSD) symptoms identified two groups of youth high in CU traits consistent with primary and secondary CU. Youth were typologized on the basis of PTSD symptoms which represents a novel method that is consistent with the theory underlying secondary callousness. Compared to youth classified in the primary group, youth classified as secondary CU reported higher levels of PTSD symptoms, anxiety, trauma exposure, and difficulties with clarity of emotions and nonacceptance of emotions. Difficulties in emotion regulation reported by youth in the secondary versus primary groups may be related to processes involving emotional numbing in the aftermath of posttraumatic distress. The results of the current study have implications for the classification of primary and secondary CU as well as the clinical treatment of youth with these characteristics.

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INTRODUCTION

Recent research on the development of delinquency has focused on the role of callous-unemotional (CU) traits, a construct related to the adult concept of psychopathy that is thought to characterize a proportion of juvenile offenders. Callous-unemotional traits among youth are defined by low levels of empathy and remorse, lack of response to punishment, and deficits in emotional processing particularly related to fear and anxiety (Frick & Marsee, 2006; Frick & White, 2008; Kerig & Stellwagen, 2010). Among youth involved with the juvenile justice system, those high in callous-unemotional traits are thought to have a stable, severe, and aggressive trajectory (Frick & White, 2008). For these reasons, a specifier has been proposed for the presence of CU traits as indicating a subtype of youth with the diagnosis of conduct disorder in the forthcoming *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)*. Consequently, significant attention has been drawn to the need to identify these youth and to develop more effective strategies for deterring them from an antisocial pathway.

However, emerging research suggests that there may be two groups of youth high in CU traits, arriving at the same outcome from distinct developmental trajectories. Differentiating between these two trajectories to juvenile delinquency is an issue of importance for the legal system in reducing recidivism, for the mental health system in identifying which youth should be prioritized for treatment, and for researchers attempting to identify risk and protective factors for delinquency (Frick, 2009). To this

end, the present study investigated the hypothesis that youth with primary versus secondary callousness can be differentiated on the basis of PTSD symptoms, and further that these two groups differ in their ability to regulate emotion. To set the stage for the present study, first the literature on primary versus secondary CU is reviewed, then focus is turned to the role of PTSD in delinquency generally and its relation to CU traits, and then I discuss the hypothesized role of emotion dysregulation in primary versus secondary callousness.

Distinguishing between Primary and Secondary CU

According to theorists (e.g., Blair, Peschardt, Budhani, Mitchell, & Pine, 2006), primary callousness arises as a function of a genetically-based deficit in emotion processing that results in a lack of anxiety and guilt. The lack of responsiveness to others' negative emotional cues demonstrated by individuals with classic psychopathy or CU is believed to contribute to diminished sensitivity to others' distress and to punishment cues (Cleckley, 1941). One connection between primary CU traits and delinquent behavior is based on the notion that individuals high in CU traits are unable to experience moral emotions such as guilt, remorse, and empathy and therefore their ability to recognize distress in a victim is impaired (Blair, 1995; 1999). However, more recent research has identified heterogeneity among individuals high in CU traits, and emotion processing has been key to distinguishing between the two types. For example, Kimonis and colleagues (2012) determined that two distinct variants of youth high in CU traits also differ on the processing of emotional cues from others, which has been considered central to the concept of CU. Kimonis and colleagues (2012) found that among male juvenile offenders, individuals with secondary CU traits were more engaged by distressing

emotional images than were youth with primary CU traits. Therefore, individuals with secondary CU traits may not show the same deficit in empathy that is considered characteristic of primary CU.

Contrary to the classic conceptualization of psychopathy and primary CU, the concept of “secondary psychopathy” (Karpman, 1941) or “acquired callousness” (Kerig & Becker, 2010) asserts that individuals who have experienced heightened emotional reactivity through traumatic victimization can develop a callous appearance over time. Whereas youth high in primary CU traits are categorized by deficits in processing others’ emotional states, youth with secondary CU traits may be more prone to deficits in regulating their own emotional states. Bowlby (1944) described the home lives of 44 juvenile offenders and noted that one group, who seemed to present with a lack of affection for others, were more likely than the other youth to have lost a mother figure in childhood. Bowlby (1944) remarked that “behind the mask of indifference is bottomless misery and behind the apparent callousness despair” (p. 24). These youth, rather than having an emotional deficit, are viewed as hiding their heightened emotional distress by presenting a “mask” of callousness. Given that skills such as emotion regulation are typically learned through early interactions with caregivers (Kerig, Ludlow, & Wenar, 2012), these youth who have experienced trauma, often at the hands of caregivers, may be especially susceptible to deficits in their own abilities to react appropriately to emotional stimuli. These emotional difficulties experienced by youth with trauma histories may help to explain the link between trauma and delinquency for youth with secondary CU traits.

Although researchers have found an association between trauma and delinquency, the mechanisms through which this occurs are not well understood. Wood, Foy, Layne,

Pynoos, and James (2002) assessed trauma exposure in a sample of male and female juvenile offenders, and found that the youths' history of physical punishment in childhood accounted for 10% of the variance in gun possession and use in girls, and that community violence exposure accounted for an additional 20% of the variance. Trauma exposure also was associated with higher levels of gang involvement for boys and girls. Studies have suggested that the link between trauma exposure or maltreatment in childhood and delinquency may be even stronger for girls (see Kerig & Becker, 2010, for a review). It is possible that the emotional difficulties that are experienced by youth with secondary CU traits, having developed in response to trauma exposure, are placing these youth at further risk for delinquent behavior. The current study adds to the literature connecting trauma and delinquency by using PTSD symptoms to differentiate between primary and secondary variants of high-CU youth, and further examining the role of emotion dysregulation for these groups.

Following Bowlby's (1944) logic, Porter (1996) theorized that trauma-exposed youth may develop a learned detachment from emotion in contrast to the inherent emotional deficits seen in primary callous youth. Porter theorized that individuals with secondary CU traits have the capability to respond empathetically to others, but that their reactions to others' emotions are inhibited by attempts to avoid feeling their own negative emotions. This strategy of avoidance of emotions is reinforced as a coping technique over time because it is less painful than allowing themselves to continue feeling vulnerable. Ford, Chapman, Mack, and Pearson (2006) termed this mechanism "survival coping," wherein youth who have been traumatically victimized develop an angry, hostile, or callous façade as a form of coping that is associated with delinquent behavior. This theory may help to explain Kimonis and colleagues' (2012) results by suggesting that

youth with secondary CU traits are better than youth with primary CU traits at recognizing negative emotional cues in others because they have experienced those same emotions themselves through their own histories of trauma exposure.

The Role of Posttraumatic Stress Disorder in Secondary CU

Rates of trauma exposure are high among juvenile justice-involved youth. For example, Abram et al. (2004) found that over 92% of a sample of nearly 900 youth in juvenile detention had experienced at least 1 traumatic event, over half had experienced more than 6 traumatic events, and the average number of traumas experienced was 14. Consistent with the high rates of trauma exposure, posttraumatic stress disorder (PTSD) is among the most prevalent psychiatric disorders in the juvenile justice system. Studies have found the prevalence of PTSD to be as high as 50% among detained girls and as high as 30% for detained boys (Kerig & Becker, 2012). Further, research has indicated that for some youth, PTSD status is predictive of recidivism, and that repeat offending is associated with increased mental health issues (Becker, Kerig, Lim, & Ezechukwu, 2011).

Because the vast majority of youth in detention have experienced trauma, including youth with both primary and secondary CU traits, the severity of PTSD symptoms may better discriminate subtypes of youth high in CU. Based on Porter's (1996) theory and the work of Ford and colleagues (2006), it would be predicted that those youth who developed PTSD symptoms in response to trauma are at heightened risk to develop callousness and engage in delinquency as a result. Research to date confirms that detained youth with secondary CU traits exhibit higher levels of PTSD symptoms than do youth with primary CU traits or nondetained comparison samples (Krischer &

Sevecke, 2008; Sink, 2010; Tatar, Cauffman, Kimonis, & Skeem, 2012). Vaughn, Edens, Howard, and Smith (2009) found evidence for the identification of distinct groups of youth with primary and secondary CU traits using trauma exposure as a differentiating variable. Tatar and colleagues (2012) were the first to assess trauma exposure using more than a few items, and were among the first to assess a range of potential traumatic experiences beyond types of child abuse. The authors found that the secondary group endorsed 30% more traumatic experiences than either the primary or low-CU comparison sample, and there was no difference in trauma exposure between the primary and comparison samples. The authors investigated group differences in PTSD symptoms as well and determined that the secondary group endorsed 28% more past PTSD symptoms than the primary group or the comparison group. One limitation of this study is that it included only male adolescents, and research has shown that there may be a stronger link between PTSD and delinquency for girls (Kerig & Becker, 2010), although it must be acknowledged that other studies have identified an association between trauma exposure and callousness for boys but not girls (Krischer & Sevecke, 2008). Therefore, further research is needed to clarify whether levels of PTSD symptoms differentiate between primary and secondary CU among both male and female adolescents. To this end, the present study uses a measure of PTSD symptoms to form groups of youth with primary and secondary CU traits using a sample of detained boys and girls.

Anxiety as a Differentiator between Primary and Secondary Callousness

Whereas theoretically the experience of anxiety is antithetical to the concept of psychopathy (Cleckley, 1941), research examining the association between CU and anxiety has been mixed, likely due to the majority of studies failing to distinguish

between primary and secondary variants (Dolan & Rennie, 2007). When both primary and secondary CU traits are considered, many studies have suggested that individuals with secondary CU traits report higher levels of anxiety than those with primary traits, and trait anxiety has continued to serve as the most commonly used differentiator of primary and secondary variants of high-CU youth (e.g., Krischer & Sevecke, 2008; Lee, Salekin, & Iselin, 2010; Skeem, Poythress, Edens, Lilienfeld, & Cale, 2003). However, the empirical evidence for using anxiety as the sole basis for differentiating these groups is not entirely clear. Despite findings indicating CU traits to be inversely related to anxiety in general, Skeem and colleagues (2003) reviewed the literature and concluded that there is little compelling evidence that either children or adults classified in the primary or secondary variants reliably differ on measures of anxiety, given that a number of studies have found null results (e.g., Schmitt & Newman, 1999). One explanation for the lack of consistent differences in anxiety may be the prevalent experience of trauma among delinquent youth. Kalisch and colleagues (2005) argued that the experience of anxiety for youth in conditions of ongoing trauma exposure may be maladaptive, and these youth may avoid subjective distress through learned emotional numbing, consistent with Porter's (1996) theory. Relatedly, emotional numbing has been identified as a mediator of the association between trauma exposure and CU traits for juvenile justice-involved youth (Kerig, Bennett, Thompson & Becker, 2012). The majority of studies have focused on psychopathy among adults, and it is possible that differences in anxiety are obscured by the progression of emotional numbing over time. Based on the mixed efficacy of identifying subgroups on the basis of anxiety, the current study sought to differentiate primary and secondary variants of high-CU adolescents using PTSD symptoms, which is more consistent with Porter's (1996) theory of secondary

psychopathy.

Differences in Emotion Dysegregation between Primary and Secondary CU

Functionally, emotions are intended to prepare an individual for action (Cole & Hall, 2008). As described in an overview by Cole and Hall (2008), emotions serve an ongoing evaluative purpose to determine the level of threat present in a situation and organize action in response to threat. Emotion regulation is the process of cuing modulation of emotional reactions based on changes in one's circumstances. According to Cole and Hall (2008), emotion dysregulation does not imply that emotions are not being regulated, but rather that there is a cost associated with the way the emotions are being regulated. For example, the experience of negative emotions does not suggest dysregulation as long as the experience of the emotion leads to organized behavior. Similarly, the experience of positive emotions can be inappropriate in some situations.

Emotion dysregulation is believed to underlie many forms of psychopathology, and is considered to be a key component of PTSD. Conceptually PTSD is characterized by a number of emotional reactions to a traumatic event. Involuntary repetitive intrusive episodes alternate with periods of denial, avoidance, and emotional numbing. Horowitz (2011) argued that PTSD is inherently a disorder of dysregulated emotion, describing the “phasic tendencies” of types of PTSD symptoms (re-experiencing, avoidance) as indicative of a struggle to achieve emotional equilibrium. Similarly, Cole, Michel and Teti (1994) described that emotion dysregulation can be problematic in two ways: underregulation, as with issues of impulse control, or overregulation, such as emotional numbing. In order to have effective emotion regulation, a balance must be achieved.

Cognitive control of emotion theory asserts that the intensity of an emotional response is determined by mismatch between the level of threat a person appraises from their circumstance and the availability of coping resources. In this way, PTSD is characterized by a feedback loop between emotions and cognitions attempting to modulate emotional responses to perceived threat in order to reach an optimal equilibrium between underregulation and overregulation of emotions.

Despite the importance given to emotion regulation in Horowitz's (2011) framework of PTSD, few studies have investigated the role of emotion regulation in PTSD, and to date none have done so among youth. Gratz and Roemer (2004) described an integrative conceptualization of emotion regulation comprising six dimensions: nonacceptance of emotional responses, difficulty engaging in goal-directed behavior when under stress, impulse control difficulties when under stress, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity. Using this conceptualization, a total of four known studies have examined the relation of emotion dysregulation to PTSD symptoms in adults. Using a sample of undergraduates, the majority of whom were female and had subclinical levels of PTSD symptoms, Tull, Barrett, McMillan, and Roemer (2007) found that emotion dysregulation overall was associated with more severe PTSD symptoms, and that PTSD symptom severity was associated with five of the six elements of emotion dysregulation they examined: nonacceptance of emotional responses, difficulty engaging in goal-directed behavior when under stress, impulse control difficulties when under stress, limited access to emotion regulation strategies, and lack of emotional clarity; but not lack of emotional awareness. Similarly, McDermott and colleagues (2009) identified that, among a sample of patients in a residential substance dependence program, those with PTSD had greater

difficulty with emotion regulation, evidencing significantly higher scores on the same five elements of emotion dysregulation identified by McDermott and colleagues (2009). In turn, Ehring and Quack (2010) compared adults with noninterpersonal trauma, early-onset chronic interpersonal trauma, early-onset single-incident interpersonal trauma, and late-onset interpersonal trauma. The authors concluded that whereas those with early-onset chronic trauma had greater difficulties with emotion regulation on each of the six facets examined in the previous studies, group differences were only significant for lack of awareness, lack of clarity, difficulties with goal-directed behavior, and difficulty with impulse control, and after controlling for PTSD symptom severity, only lack of clarity and difficulties with goal-directed behavior remained significant. Finally, Weiss, Tull, Davis, Dehon, Fulton, and Gratz (2012) sought to determine whether emotion dysregulation differences were more related to trauma exposure in general or the development of PTSD. In a sample of African American undergraduate women, the authors found that participants who met criteria for PTSD had higher levels of overall emotion dysregulation as well as higher scores on of the facets of nonacceptance of emotions, difficulties engaging in goal-directed behavior, difficulties controlling impulsive behavior, and lack of access to effective strategies as compared to those with no Criterion A traumatic events or with Criterion A experiences but without PTSD. These results suggest that rather than the experience of trauma in general, emotion dysregulation difficulties are more closely associated with the development of PTSD symptoms.

Despite the lack of attention paid to youth in the literature to date, studies suggests that emotion regulation deficits associated with PTSD may be especially important for youth involved in the juvenile justice system. It is known that both PTSD

and CU are related to a higher likelihood of delinquency and that each are related to emotion dysregulation. For youth with PTSD and CU traits, emotion dysregulation issues are interfering with their functioning in ways that are directly contributing to their delinquency and thereby placing them at risk for continued problems. In order to better understand youth with secondary CU traits, the literature on emotion dysregulation as associated with PTSD and CU must be merged.

Interrelationships among PTSD, CU, and Emotion Regulation

Among the dimensions of ER identified by Gratz and Roemer (2004) in their conceptual and empirical model, there are four that emerge as clearly related to the intersection between PTSD and callousness in the literature to date: nonacceptance of emotional responses, lack of emotional awareness, lack of emotional clarity, and impulse control difficulties when under stress.

Nonacceptance of Emotional Responses

Secondary CU is believed to arise out of efforts to avoid negative emotional states. Cole and Hall (2008) concluded that the ability to mask emotional states develops as early as age 3 when youth begin to understand social norms regarding which emotions are acceptable to feel and to whom those emotions can be shown. Ford and colleagues' (2006) expansion on Porter's (1996) theory suggested that some youth develop CU traits through the disavowal of their emotions following a history of victimization in an attempt to regain a sense of control over themselves and their situation, thereby creating a callous façade. Youth with secondary CU traits, therefore, mask emotions associated with vulnerability that they find to be unacceptable for them to show. This masking of

vulnerable emotions is contrary to the inherent deficits in the experience of certain emotions displayed by youth with primary CU traits.

Emotional Clarity

Alexithymia, or the inability to identify and describe one's own emotional states, is likely associated with the experience of trauma. For example, using a sample of Holocaust survivors, Yehuda and colleagues (1997) found that alexithymia was associated with severity of PTSD symptoms but not severity of trauma exposure, and the group without PTSD but with trauma exposure demonstrated alexithymia levels similar to the general population. These findings suggest that trauma exposure alone is not predictive of emotion dysregulation in terms of emotional clarity, but that rather the development of PTSD symptoms coincides with difficulties identifying and describing one's own emotional states. Consistent with theory as it applies to primary and secondary CU traits, alexithymia may arise through a process of emotional numbing. Yehuda and colleagues (1997) found higher correlations between alexithymia and the PTSD symptom clusters of avoidance and hyperarousal, which may be indicative of an attempt to seek equilibrium between the experience of heightened emotional states and avoidance of trauma-related sensations described by Horowitz (2011). Conceptually, therefore, alexithymia should be related to secondary CU traits. In one study comparing primary and secondary CU traits, Lander, Lutz-Zois, Rye and Goodnight (2012) found that alexithymia was associated with secondary but not primary psychopathy among undergraduate students. However, Grieve and Mahar (2009) found alexithymia to be associated with both primary and secondary psychopathy. The literature on alexithymia and CU variants is inconsistent, perhaps because the association is dependent on the

process of emotional numbing. Research has shown that the numbing of emotions mediates the association between trauma exposure and CU traits for some youth (Kerig et al., 2012), and it may be possible that as youth with secondary CU become more numb over time, they are less able to identify their emotional states and begin to more closely resemble youth with primary CU traits. It is important to include PTSD when examining differences in the labeling and regulation of emotions among high-CU youth in order to disentangle the potential role of emotional numbing by better identifying youth with secondary CU traits. Therefore, the current study included PTSD symptoms in the model differentiating primary and secondary CU in order to help to account for the potential role of emotional numbing.

Impulse Control Difficulties

The experience of trauma and subsequent development of PTSD alters the way individuals' stress response systems work to interpret new information, which may be directly related to issues of impulsivity (Ford, 2009). Traumatized individuals who have developed PTSD are characterized by use of a "survival brain" that overrides brain functioning that might be dedicated to areas such as learning or managing distress in favor of self-preservation (Ford, 2009). As the brain develops following childhood trauma, the focus on survival becomes further automated through processes of synaptogenesis and pruning. Kimonis and colleagues (2011) found that juvenile offenders with primary CU traits evidenced better impulse control relative to those classified as having secondary CU traits. Similarly, Snowden and Gray (2011) found that adults classified as secondary psychopaths demonstrated greater impulsivity related to thinking without acting and planning for the future as compared to those with primary

psychopathy. These results are consistent with research examining the types of aggression most commonly perpetrated by individuals with primary versus secondary CU traits. Primary CU traits have been associated with manipulation of others, especially among boys (Grieve & Mahar, 2009) and with more instrumental, planned forms of aggression (Kerig & Stellwagen, 2010) whereas individuals with secondary CU traits tend to engage more often in reactive, emotionally-driven aggression (e.g., Falkenbach, Poythress, & Creevy, 2008). For youth whose cognitive resources are being utilized for processes geared toward self-preservation, few cognitive resources are available for the higher-order processes necessary for inhibition control. Therefore, youth with secondary CU traits are likely to have greater emotion regulation difficulties related to impulsivity.

The Current Study

The current study built on previous research by investigating several facets of emotion dysregulation among boys and girls with primary and secondary CU traits in a juvenile justice population. The majority of previous work has focused on psychopathy in adult populations, whereas much less is known about CU traits in youth. Additionally, the majority of work attempting to differentiate between primary and secondary youth has utilized all male samples, whereas it has been suggested that the experience of trauma and PTSD may be more strongly associated with delinquency for girls (Kerig & Becker, 2010). By addressing limitations to previous work using anxiety as the differentiating factor between primary and secondary callousness, the current study merged the literature on PTSD and CU in terms of emotion dysregulation in order to offer a broadened understanding of how these processes contribute to delinquency in a way that is consistent with theory on the development of CU traits in response to a history of trauma

(Porter, 1996). First, we investigated whether two distinct groups of youth high in CU traits could be identified on the basis of posttraumatic stress symptoms. We expected to find that the secondary variant would score higher on PTSD symptoms, and would also report higher levels of anxiety compared to youth with primary CU traits, but that the two groups would not differ significantly on levels of CU traits. Next, we used these groupings to examine mean differences on emotion dysregulation. Based on previous work and theory regarding PTSD and CU, it was expected that youth with secondary CU traits would evidence less acceptance of emotional responses, less emotional clarity, and more impulsivity. Given that posttraumatic emotional numbing is hypothesized to be a process that becomes more automated over time, it was unclear whether the groups would differ on their reports of their awareness of their own emotional states. Because there is insufficient literature on the other dimensions of ER used in the current study to inform directional hypotheses, this study also examined in an exploratory fashion how these two groups of youth differ in terms of their access to emotion regulation strategies and difficulty engaging in goal-directed behavior when upset.

METHOD

Participants

Participants included 417 youth (306 boys, 111 girls) recruited from a juvenile detention center located in the West. Youth ranged in age from 12 to 18 ($M = 16.15$, $SD = 1.28$) and 57.6% were non-Latino White/Caucasian, 4.3% Black/African American, 24.0% Hispanic/Latino, 3.1% Native American/Alaskan Native, 5.0% Pacific Islander/Native Hawaiian, 4.3% multiracial, 1.2% Asian American, and 0.5% other. Descriptive statistics are displayed in Table 1.

Clustering Measures

Callous-Unemotional Traits

The Inventory of Callous Unemotional traits (ICU; Frick, 2004) is a 24-item self-report measure that was developed to provide an efficient and reliable assessment of CU traits in samples of youth. Confirmatory factor analyses show the presence of three independent factors (i.e., Uncaring, Callous, and Unemotional) that relate to a higher-order Callous-Unemotional dimension. The Unemotional factor consists of 5 items (e.g., “I do not show my emotions to others”), the Callous factor consists of 9 items (e.g., “I do not care who I hurt to get what I want”), and the Uncaring factor consists of 8 items (e.g., “I feel bad or guilty when I do something wrong,” reverse coded). Items are scored on a 4-point Likert-type scale ranging from 0 (*not true at all*) to 3 (*definitely true*). Validation

of the measure indicated internal consistency ranging from .74 to .81 and construct validity as related positively to aggression and delinquency and negatively to empathy and positive affect (Kimonis et al., 2008). In the present sample, internal consistencies were .86 for the total scale, .74 for Unemotional, .73 for Callous, and .80 for Uncaring. The total scale score was used in the analyses for the current study.

PTSD Symptoms

The UCLA Posttraumatic Stress Disorder Reaction Index—Adolescent Version (PTSD-RI; Steinberg, Brymer, Decker, & Pynoos, 2004) is a widely-used measure to screen for exposure to trauma and PTSD among youth which has demonstrated good convergent validity with other diagnostic measures, high internal consistency ($\alpha = .90$), and high test-retest reliability (.84) over a period of 7 days (Roussos et al., 2005). The first set of questions asks youth whether they have been exposed to each of 24 specific traumatic events and the number of events endorsed is summed to create a Total Trauma Exposure score. Youth in the current sample reported experiencing between 0 and 21 different traumatic events ($M = 7.59$, $SD = 4.53$) with nearly 95% of the sample having experienced at least one potentially traumatic event. The second set of PTSD-RI questions inquire as to whether the youth experienced subjective reactions to that event that are consistent with *DSM-IV* Criterion A. If Criterion A is met, the remaining questions ask youth to rate the extent to which they have experienced in the past month any of the symptoms associated with Criterion B (intrusion), Criterion C (avoidance/numbing), and Criterion D (hyperarousal) as consistent with the *DSM-IV*. Responses to the questions are presented in a Likert scale format ranging from 0 (*none of the time*) to 4 (*most of the time*). Over 17% of the current sample met diagnostic criteria

for PTSD at the time of the assessment and over 35% met the symptom endorsement necessary for at least two criteria. All 32 items were used to establish Total PTSD score. For the current sample, Cronbach's alpha for the Total PTSD score was .94.

External Criteria Measures

Anxiety

The Trauma Symptom Checklist for Children (TSCC; Briere, 1996) is a self-report measure for youth that has five subscales which measure PTSD, anxiety, depression, anger, and dissociation symptoms. Only the nine item anxiety subscale was used in the present study. Each item is rated on a 4-point Likert-type scale ranging from 1 (*never*) to 4 (*almost all the time*). Internal reliability and validity of the TSCC is supported (Briere, 1996), and for the current sample, Cronbach's alpha for the anxiety subscale was .86.

Emotion Dysregulation

The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a 36-item self-report questionnaire designed to assess multiple aspects of emotion dysregulation. The measure allows for a total score as well as scores on six subscales, reported here with Cronbach's alpha in the current sample: Nonacceptance of emotional responses (Nonacceptance, 6 items, $\alpha = .82$), difficulties engaging in goal directed behavior (Goals, 5 items, $\alpha = .82$), impulse control difficulties (Impulse, 6 items, $\alpha = .86$), lack of emotional awareness (Awareness, 6 items, $\alpha = .83$), limited access to emotion regulation strategies (Strategies, 8 items, $\alpha = .85$), and lack of emotional clarity (Clarity, 5 items, $\alpha = .73$). Each item is rated on a 5-point Likert-type scale ranging from 1 (*almost*

never) to 5 (*almost always*). Validation of the measure suggested high internal consistency for each subscale ($\alpha > .80$) and the total score ($\alpha = .93$) as well as high test-retest reliability across 8 weeks of .88 for the total score (Gratz & Roemer, 2004).

Procedure

All study procedures were approved by the Institutional Review Boards (IRBs) of the University of Utah, Utah Department of Child and Family Services, and the Salt Lake Valley Detention Center. At visitations to the detention center, legal guardians provided signed informed consent after which youth were invited to provide signed assent. To eliminate any perceptions of coercion, the IRBs required that no incentives be offered for participation. Youth interviews were conducted individually by a research assistant in a private room within the detention center.

Table 1

Means and standard deviations for the total sample, the low-CU comparison sample, and the primary and secondary clusters

	Lower-CU			
		Comparison	Primary CU	Secondary
	Total Sample	Group	Cluster	CU Cluster
	(<i>N</i> = 417)	(<i>n</i> = 279)	(<i>n</i> = 76)	(<i>n</i> = 55)
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Age	16.15 (1.28)	16.26 (1.26) _a	15.85 (1.33) _a	16.06 (1.32) _a
% Ethnic Minority	42.4	37.3 _a	50.0 _a	54.5 _a
Total CU	22.33 (9.71)	16.93 (5.91) _a	33.24 (5.60) _b	33.62 (6.04) _b
Total Trauma Types	7.60 (4.52)	7.21 (4.53) _a	6.44 (3.90) _a	10.85 (3.72) _b
Total PTSD Score	23.71 (14.43)	22.42 (14.29) _a	16.41 (8.51) _b	39.96 (8.38) _c
Anxiety	13.77 (4.35)	13.61 (4.19) _a	12.74 (4.49) _a	15.78 (4.46) _b
DERS- Nonacceptance	10.78 (4.30)	10.65 (4.22) _a	9.90 (4.01) _a	12.15 (4.50) _b
DERS- Awareness	17.20 (5.74)	15.38 (5.21) _a	21.36 (5.19) _b	20.09 (4.70) _b
DERS- Goals	13.95 (4.80)	13.67 (4.79) _a	13.73 (4.63) _a	15.75 (4.82) _b
DERS- Strategies	16.66 (6.54)	16.35 (5.91) _a	15.26 (5.40) _a	19.96 (6.61) _b
DERS- Clarity	10.18 (3.73)	9.50 (3.50) _a	10.67 (3.27) _b	12.60 (4.19) _c
DERS- Impulse	12.81 (5.20)	12.33 (5.12) _a	12.97 (4.91) _{ab}	14.79 (5.54) _b

Note. Seven youth classified as high-CU were missing all data on PTSD symptoms and therefore were not classified into either primary or secondary and are included in the total sample but not in any of the subgroups. Scores in the same row that do not share subscripts differ significantly ($p < .05$) based on independent samples *t*-tests.

RESULTS

Classifying Primary and Secondary Variants

Although research suggests that callous-unemotionality can be represented as a dimensional trait (e.g., Edens et al., 2006; Lilienfeld, 1994; 1998), the theory underlying CU proposes that youth at the extreme high end of the continuum constitute a distinct group by virtue of displaying pathological levels of CU. Accordingly Frick (2003) has argued that high-CU youth differ from other conduct-disordered youth and resemble the conceptualizations of adult psychopathy. Consistent with this idea, there is evidence of psychopathy as a taxonic trait (Vasey, Kotov, Frick, & Loney, 2005). In this regard, dividing a sample into low- and high-CU groups is appropriate if the high-CU group is categorically distinct, given that an underlying nonlinear relation is expected in categorical constructs (Sonuga-Barke, 1998). Therefore, research to date examining primary and secondary variants has used clustering techniques based upon the subset of youth in the sample who are high in CU traits. To allow for comparisons to this existing body of research, we followed the strategy utilized by previous investigators regarding primary and secondary CU (e.g., Finger et al., 2008; Hicks et al., 2010; Kimonis et al., 2010; Kimonis et al., 2012; Marsh et al., 2006; Tatar et al., 2012; Vitale et al., 2005) and employed a threshold cutoff score to select youth who scored high relative to the remainder of the sample. This strategy allows for a comparison of primary versus secondary clusters within this high-CU group while simultaneously allowing for a

comparison of these groups to a low-CU portion of the sample. Given that these previous studies have used different measures of CU traits than were utilized in the present study, and that no clinical cutoff score has been established for the ICU to identify youth as “high CU,” we followed the logic laid out by Skeem et al. (2007) and Murrie and Cornell (2002), who advocated for identifying as high-CU those participants scoring in the top third of a sample. In the current sample, this rubric resulted in classifying as high-CU those boys and girls who obtained ICU Total scores greater than 26 ($n = 138$). The remaining youth with ICU Total scores of 26 or lower ($n = 279$) were used as a comparison group. The characteristics of the total sample as well as each subsample are displayed in Table 1.

Once the high-CU youth were identified using the cutoff score on the ICU, we used mixture modeling to classify the youth into two groups based on their PTSD symptom scores. The mixture model was performed using Mplus version 6.11 (Muthén & Muthén, 1998-2011) which was programmed to create two classes as consistent with the theory of primary and secondary CU, allowing factor means for Total PTSD Symptoms scores to vary across groups. All 32 items on the PTSD-RI were used in the model to comprise Total PTSD Symptoms scores. Of the 138 youth included in the mixture model, 7 were missing data on PTSD and could not be classified. Of the remaining 131 youth, 76 (11 girls) were placed in Class 1, labeled ‘primary,’ and 55 (20 girls) were placed in Class 2, labeled ‘secondary.’ The parametric bootstrapped likelihood ratio test suggested better fit of a 2-class model as compared to a 1-class model (H_0 log likelihood = - 6544.064, $p < .001$). Average latent class probabilities for most likely latent class membership were .90 and .85, respectively, with off-diagonal probabilities of .15 and .10

indicating the degree of misclassification. Posterior probabilities for each class were extracted for use in later analyses.

Validation of Clusters

Using the most likely class assignment for each individual, independent-samples *t*-tests and chi square analyses suggested a number of group differences. As specified in the model, the secondary group reported significantly higher levels of PTSD symptoms, class 1 $M = 2.25$, $SE = .19$, 95% $CI = [1.89, 2.62]$, class 2 $M = 2.95$, $SE = .14$, 95% $CI = [2.67, 3.23]$. A number of external variables were also examined for group differences. The secondary group reported significantly higher levels of anxiety, $t(126) = -3.79$, $p < .001$, and had a greater proportion of girls than the primary group, $\chi^2(1) = 8.27$, $p = .004$. The primary and secondary CU groups did not differ in age, ethnicity, or any scales of the ICU. Of the youth classified as primary, none met full DSM-IV criteria for a diagnosis of PTSD, whereas 51% of youth classified as secondary and 15% of the comparison sample met full criteria.

Independent samples *t*-tests were also conducted to investigate differences between the high-CU groups and the lower-CU groups. The high-CU youth (including both primary and secondary youth) reported greater levels of PTSD symptoms, $t(399) = 2.59$, $p = .01$, and CU traits, $t(407) = 26.43$, $p < .001$, but not anxiety, as compared to the low-CU comparison group. When looked at separately, both primary, $t(352) = 21.44$, $p < .001$, and secondary, $t(332) = 19.06$, $p < .001$, groups scored higher on total CU traits as compared to the comparison group. When compared to the lower-CU comparison youth, primary CU youth reported fewer PTSD symptoms, $t(201.15) = -4.48$, $p < .001$, but did not differ in age or anxiety. When compared to the lower-CU comparison sample,

secondary CU youth reported greater levels of PTSD symptoms, $t(127.63) = 12.31, p < .001$, and anxiety, $t(318) = 3.43, p = .001$, but did not differ in age.

Differences in Emotion Dysregulation

Following the establishment of two classes of youth based on PTSD scores, consistent with primary and secondary CU variants who are high in CU traits, a second model was run to examine how the groups differed on facets of emotion dysregulation. The model used Monte Carlo integration to predict class membership from subscale scores on the DERS. Due to the limited sample size, the model was simplified by using scale scores for each DERS subscale as well as total PTSD symptoms in order to reduce the amount of estimated parameters, and DERS subscales were allowed to correlate. In order to ensure that the same classes were created as in the original mixture model, the posterior probabilities from the previous model were included as training data in this new model that added the DERS subscales. The model was run simultaneously for all subscales of the DERS, and therefore the following results represent the unique effect for each subscale, after controlling for each of the others. Model results suggested that class membership differed significantly for the DERS subscales of lack of emotional clarity, $B = -.63, SE = .28, 95\% CI = [-1.18, -0.09], p = .023$, and nonacceptance of emotional responses, $B = -.56, SE = .27, 95\% CI = [-1.09, -0.03], p = .039$. Logistic regression odds ratio results indicated that, compared to the secondary group, membership in the primary group was approximately half as likely as scores increased on nonacceptance of emotional responses, $OR = 0.57, 95\% CI = [0.39, 0.97]$, shown in Figure 1, and lack of emotional clarity, $OR = 0.53, 95\% CI = [0.31, 0.92]$, shown in Figure 2 and, although only a trend approaching statistical significance, membership in the primary group was

also about half as likely as scores increased on limited access to emotion regulation strategies, $OR = 0.57$, 95% $CI = [0.32, 1.03]$, $p = .064$, shown in Figure 3. Although not significant, membership in the primary CU group was more likely as scores increased on the subscales of lack of awareness, $OR = 1.37$, 95% $CI = [0.86, 2.20]$, $p > .10$, shown in Figure 4, and lack of impulse control, $OR = 1.19$, 95% $CI = [0.67, 2.14]$, $p > .10$, shown in Figure 5, but the likelihood of membership in the primary CU group decreased as scores increased on difficulty engaging in goal-directed behavior, $OR = 0.71$, 95% $CI = [0.46, 1.09]$, $p > .10$, shown in Figure 6. Overall, the results suggest that secondary youth reported significantly greater difficulties with emotional clarity and nonacceptance of emotional responses as compared to youth with primary CU traits.

The primary and secondary groups of youth also were compared to the comparison group on facets of emotion dysregulation using independent-samples t -tests. The high-CU group (including both primary and secondary CU youth) differed from the comparison sample on the DERS subscales of lack of emotional awareness, $t(255.53) = 9.90$, $p < .001$, lack of emotional clarity, $t(387) = 5.09$, $p < .001$, and impulse control difficulties, $t(387) = 2.51$, $p = .013$. The primary group reported higher scores on the subscales of lack of emotional awareness, $t(334) = 8.67$, $p < .001$, and lack of emotional clarity, $t(334) = 2.57$, $p = .011$, when compared to the comparison sample. In turn, the secondary group reported greater difficulty than the comparison group on each scale of emotion dysregulation: lack of emotional awareness, $t(314) = 6.10$, $p < .001$, lack of emotional clarity, $t(314) = 5.69$, $p < .001$, impulse control difficulties, $t(314) = 3.14$, $p = .002$, difficulty engaging in goal-directed behavior, $t(314) = 2.87$, $p = .004$, nonacceptance of emotional responses, $t(314) = 2.33$, $p = .021$, and limited access to emotion regulation strategies, $t(314) = 3.63$, $p < .001$.

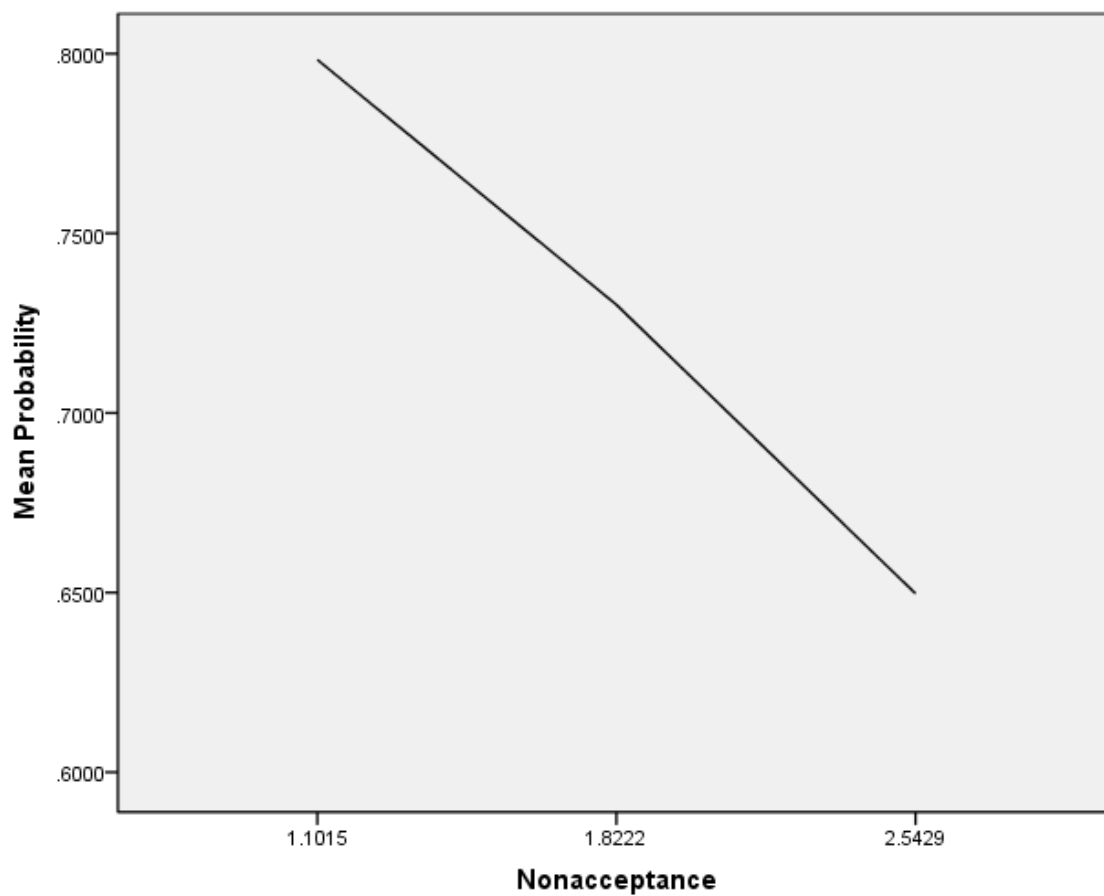


Figure 1

Probability of membership in primary CU group with changes in nonacceptance of emotional responses. Values shown are for the mean, one standard deviation below the mean, and one standard deviation above the mean.

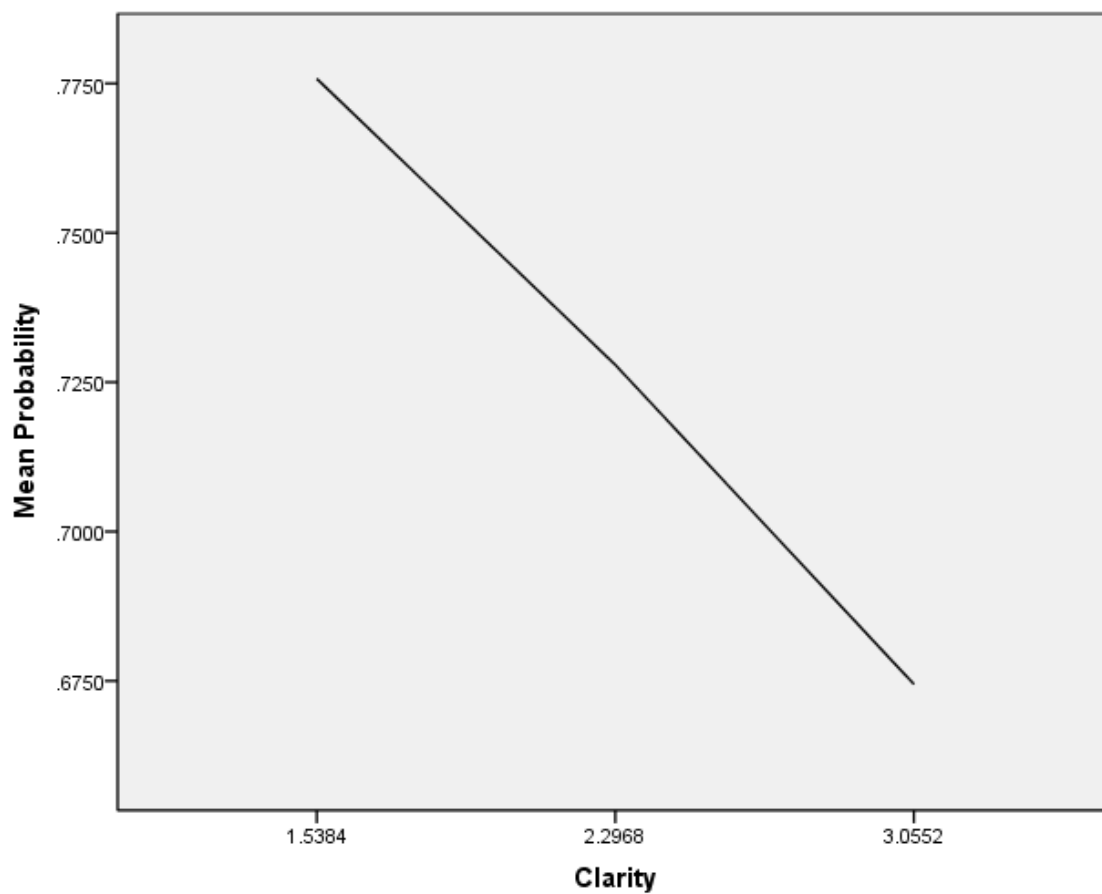


Figure 2

Probability of membership in primary CU group with changes in lack of clarity of emotions. Values shown are for the mean, one standard deviation below the mean, and one standard deviation above the mean.

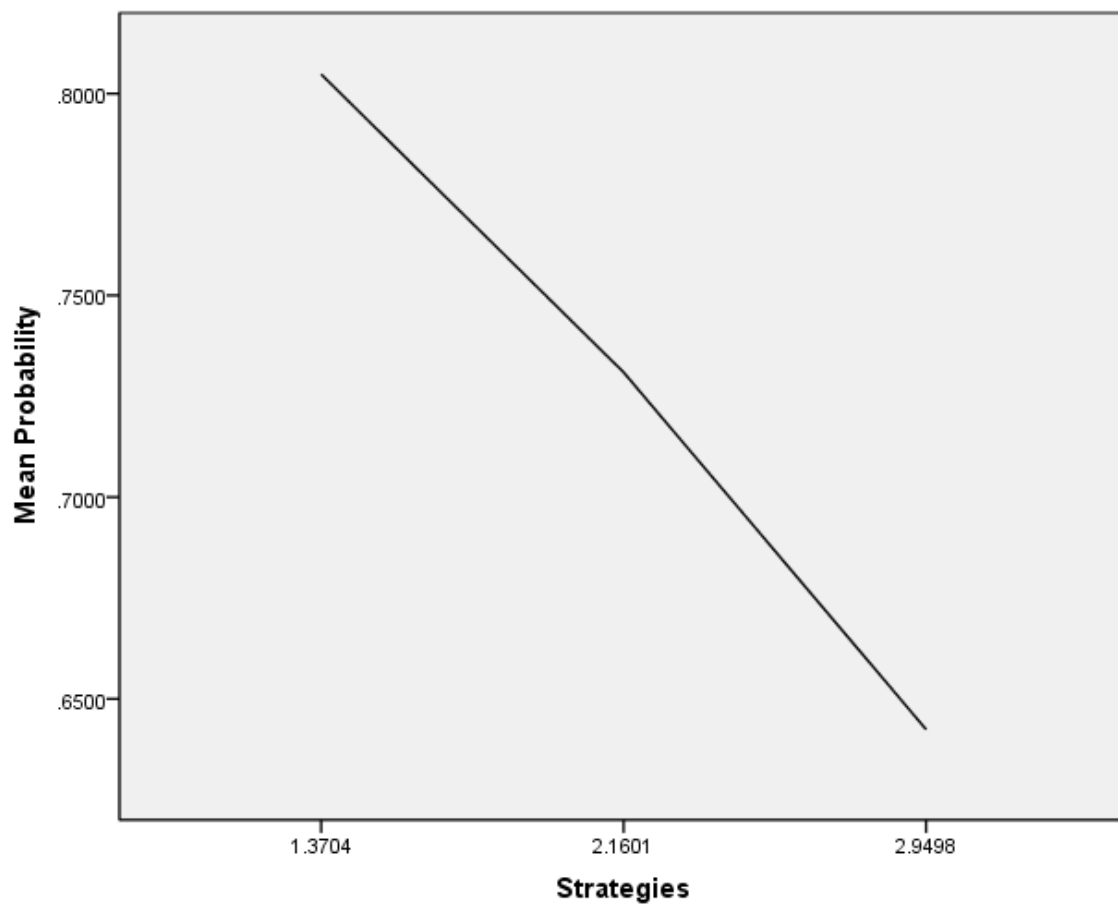


Figure 3

Probability of membership in primary CU group with changes in limited access to emotion regulation strategies. Values shown are for the mean, one standard deviation below the mean, and one standard deviation above the mean.

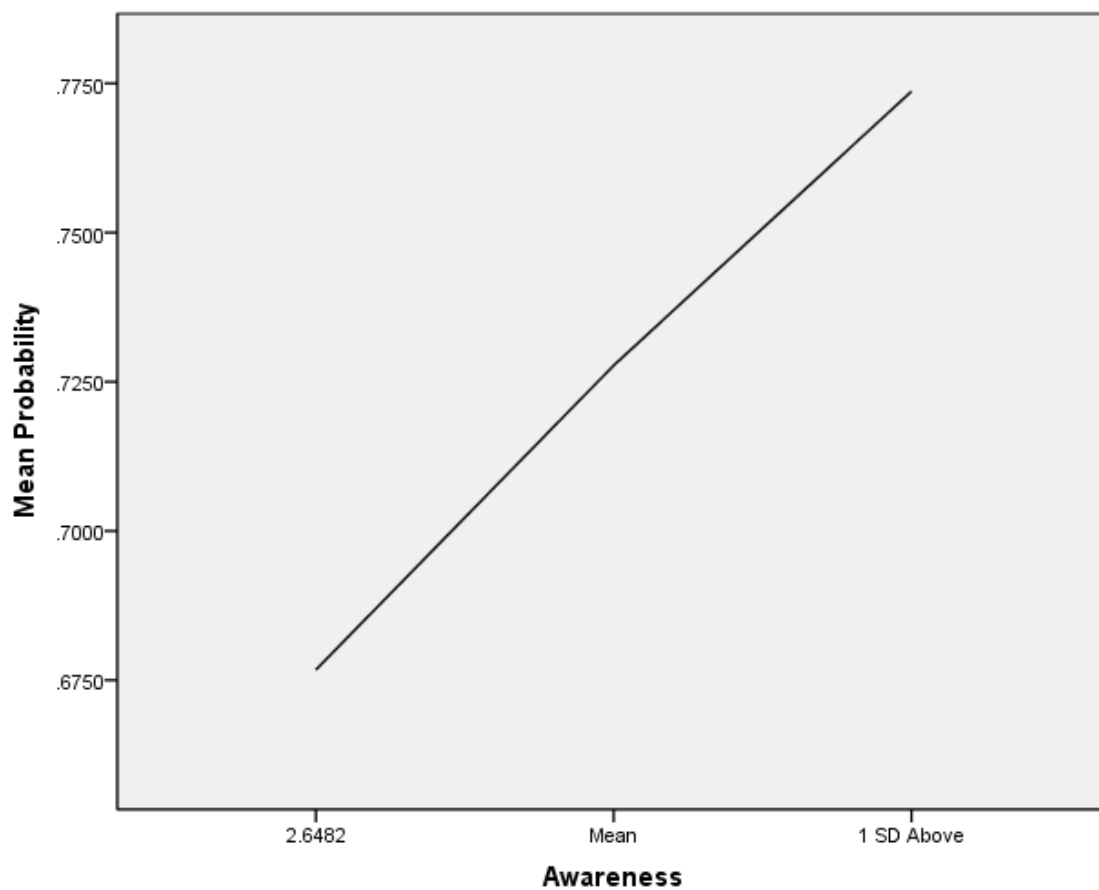


Figure 4

Probability of membership in primary CU group with changes in lack of emotional awareness. Values shown are for the mean, one standard deviation below the mean, and one standard deviation above the mean.

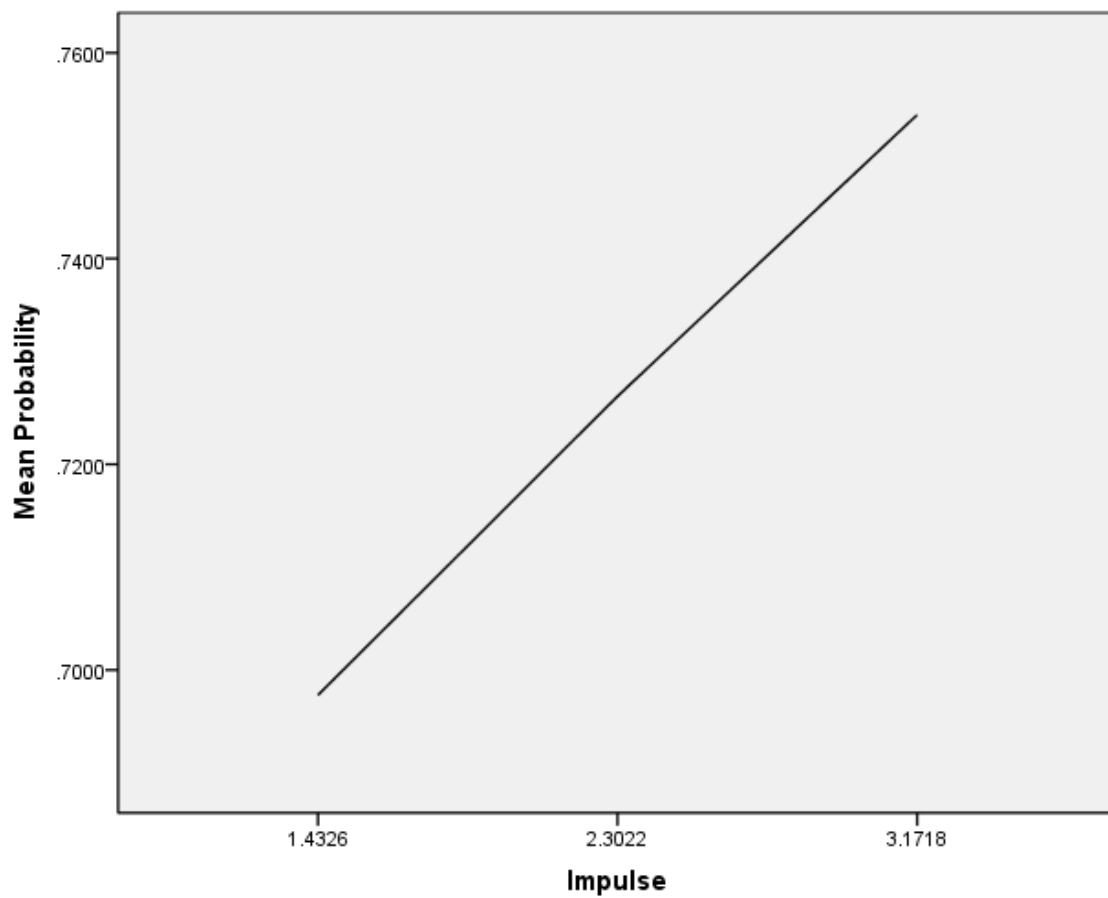


Figure 5

Probability of membership in primary CU group with changes in impulse control difficulties. Values shown are for the mean, one standard deviation below the mean, and one standard deviation above the mean.

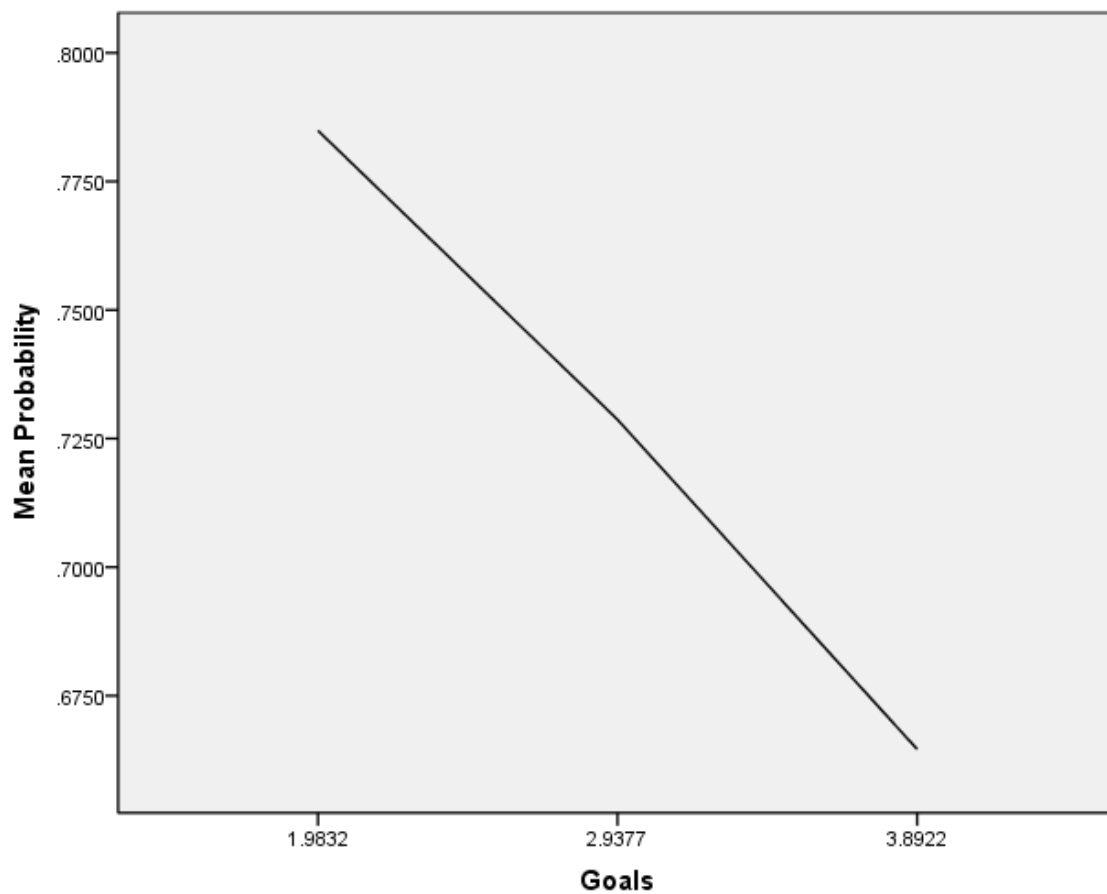


Figure 6

Probability of membership in primary CU group with changes in difficulty engaging in goal-directed behavior. Values shown are for the mean, one standard deviation below the mean, and one standard deviation above the mean.

DISCUSSION

The groups of youth identified as having primary and secondary CU traits in the current study descriptively resemble groups with similar traits identified in previous studies. The secondary group reported significantly higher levels of anxiety, which is consistent with the findings of other researchers (e.g., Krischer & Sevecke, 2008; Lee et al., 2010; Skeem, et al., 2003). Moreover, the current study found these established differences while utilizing a novel approach to determining group membership based on trauma theory. In the present study, the groups were composed on the basis of PTSD symptoms, which is consistent with Porter's (1996) theory regarding the role of emotional responses to trauma exposure in the development of CU. Porter (1996) argued that individuals who have experienced trauma may develop a learned emotional detachment as a method of self-protection, resulting in a callous presentation. In this sense, Porter's conceptualization of the origins of secondary CU is more closely related to traumatic emotional reactions rather than to general trait anxiety. Consistent with the predictions derived from Porter's theory, the primary and secondary groups differed in their self-reports of PTSD symptoms, trauma exposure, and anxiety, which is similar to the findings of others who examined similar constructs among primary and secondary CU using anxiety to differentiate the groups (e.g., Tatar et al., 2012; Vaughn et al., 2009). Overall, the results of the composition of clusters suggest that using PTSD symptoms to differentiate primary and secondary groups of high-CU youth achieves clusters similar to

those identified using anxiety as a differentiator, while maintaining closer adherence to the theory underlying secondary psychopathy.

Whereas Porter's (1996) theory of secondary CU suggests that PTSD has an influence on callousness for some individuals, previous studies have generally used trait anxiety to differentiate primary and secondary CU. However, this method may be measuring only one aspect of the emotional difficulties associated with PTSD. The recently proposed Dysphoric Arousal model of PTSD (Elhai, Biehn, Armour, Klopfer, Frueh, & Palmieri, 2011) supports the presence of five factors of PTSD symptoms: intrusion, avoidance, numbing, dysphoric arousal, and anxious arousal. Support for this model suggests that the anxious arousal factor is associated with unique outcomes relative to other factors. Anxious arousal represents a facet of the symptom presentation of PTSD that is rooted in fear responses (Elhai et al., 2011), yet recent research indicates that reactions to trauma span beyond just fear (Kerig & Bennett, 2012; Friedman, et al., 2011). Future research would benefit from utilizing all clusters of the five-factor model of PTSD in order to investigate how PTSD symptom profiles might be predicted by emotion dysregulation patterns for high-CU youth.

Comparison of group means showed that high-CU youth classified as primary and secondary differed from the lower-CU comparison group on both the grouping variable of PTSD symptoms and the external variables included in the present study. Most notably, the secondary group reported higher levels of PTSD symptoms, anxiety, and all facets of emotion dysregulation when compared to the comparison sample. These findings are consistent with the conceptualization that secondary CU youth have higher levels of general distress than do primary or low-CU youth (Vaughn et al., 2009), which has implications for the clinical treatment for this population, suggesting that clinical

interventions reducing distress may also reduce delinquency. Youth in the primary group did not report significantly higher levels of anxiety compared to the lower-CU youth, which is inconsistent with what is generally considered the key defining feature of psychopathy. There is a growing discussion of whether or not absence of anxiety is characteristic of primary psychopathy as compared to the general population (e.g., Dolan & Rennie, 2007; Schmitt & Newman, 1999), and the current findings suggest that youth with primary CU traits do not report lower levels of anxiety compared to their low-CU counterparts. Studies that only include youth high in CU traits have the potential to overlook the differences and similarities between youth with high and low CU traits. Therefore, including youth both high and low in CU traits allows for researchers to test the assumptions underlying the separation of high-CU youth. Despite not differing on reports of anxiety, youth typologized as primary CU differed from the comparison sample by virtue of reporting greater difficulty on the emotion dysregulation facets of lack of awareness and lack of clarity. These results are consistent with the theory underlying psychopathy and CU more classically, in that primary CU youth are thought to have an inherent deficit in emotional processing (Cleckley, 1941), leading to difficulty identifying and differentiating emotional states as compared to their low-CU counterparts. The results of the present study suggest that although anxiety may not differentiate primary CU youth from low-CU youth, the difficulties with emotion processing underlying CU may still set these groups apart.

Comparisons of emotion dysregulation across groups showed that youth typologized as secondary CU reported greater difficulty with nonacceptance of emotional responses as well as greater lack of clarity of their emotional states than did youth typologized as primary CU. One possible explanation for this finding is that

nonacceptance of distressing emotional states may be indicative of engagement in emotional numbing for this group. In other words, it may be that, consistent with Porter's (1996) argument, secondary psychopathy develops as a function of youths' disavowing their emotions subsequent to the experience of trauma. This argument is also consistent with betrayal trauma theory (Freyd, 1996), which suggests that individuals who have been victims of trauma perpetrated by close, trusted individuals, such as a parent or caregiver, are motivated to preserve the relationship despite the abuse and therefore are more likely to disengage from their emotions in order to avoid acknowledging the abuse. Consistent with this idea, Kerig et al. (2012) found that youth who experienced numbing of fear and sadness specifically in response to betrayal trauma exposure also reported higher CU traits, suggesting that betrayal trauma may play a particular role in the association between emotional numbing and the development of CU traits. The greater lack of clarity in emotional states reported by secondary CU youth as compared to primary CU also may be related to emotional numbing. Rather than being unable to differentiate their own emotional states, secondary CU youth may be unwilling to try to differentiate their emotions in order to avoid feeling vulnerable and thereby create a façade of toughness (Ford et al., 2006).

The findings of the current study may also have implications for informing the *DSM-5* diagnostic criteria for PTSD. These results suggest that high-CU youth with PTSD symptoms experience greater nonacceptance and lack of clarity of emotional responses than do other youth, yet it is notable that these emotion regulation difficulties are not included in the PTSD diagnostic criteria. Moreover, in the proposed changes to the *DSM-5*, emotional numbing symptoms are not given their own symptom cluster, despite evidence supporting such a factor structure (e.g., Bennett, Kerig, Chaplo, McGee,

& Baucom, under review; Elhai et al., 2011; King et al., 1998). However, difficulties accepting emotional responses and lack of clarity of emotional responses by youth classified in the secondary CU variant may represent an unwillingness to recognize unpleasant emotional states, which is indicative of a process of emotional numbing or experiential avoidance. Without a unique symptom cluster in the PTSD diagnosis, these symptoms may not be clearly identified or effectively used for treatment planning. In contrast, these difficulties may be better captured by the proposed Developmental Trauma Disorder (DTD) diagnosis (van der Kolk et al., 2009) which includes a set of symptoms related to dysregulated emotion, including dissociation from awareness of bodily states and impaired ability to describe emotional states. The proposed DTD diagnosis also includes a set of symptoms related to behavioral and attentional dysregulation, as well as other emotional difficulties measured by the DERS, such as difficulty engaging in goal-directed behavior. The results of the current study offer evidence in support of the consideration of such symptoms for youth who have been exposed to trauma and also are experiencing PTSD symptoms. Youths' reactions to traumatic events may be impairing their functioning through these identified aspects of emotion dysregulation, and these difficulties may not be identified or highlighted in treatment planning unless they are specified in the diagnostic criteria.

In turn, contrary to our hypothesis, youth in the primary and secondary CU categories did not differ on impulse control difficulties in the present sample. This finding is inconsistent with patterns identified by others in the literature (Anestis, Anestis, & Joiner, 2009; Kimonis et al., 2011; Snowden & Gray, 2011). One possible explanation for this unexpected finding may be that the impulse control difficulties subscale of the DERS is not a comprehensive measure of impulsivity. However, there is some evidence

to suggest that both variants of high-CU individuals may struggle with impulse control difficulties, but that impulsivity looks different in each group (Ray, Poythress, Weir, & Rickelm, 2009). The dual deficit model of psychopathy (Fowles & Dindo, 2006) proposes that primary psychopathy may be related to sensation-seeking or “exploratory” impulsivity due to decreased responsiveness to punishment cues and a diminished sense of fear, whereas secondary psychopathy is associated with deficits in executive functioning which results in poorer planning and more impulsive behavior. It is possible that the impulse control difficulties subscale of the DERS may not be accurately assessing either of these dimensions of impulsivity. Therefore, future research would benefit from inclusion of a more comprehensive measure of impulsivity to better understand how these two groups of high-CU youth may be struggling with different aspects of impulsivity.

Research on the factor structure of the DERS has suggested that the emotional awareness subscale may represent a unique construct (Bardeen et al., 2012), and the results of the current study may support the distinction between emotional awareness and emotion regulation among high-CU youth. Compared to youth in the primary CU group, youth in the secondary CU group scored higher on all subscales of emotion dysregulation except for lack of emotional awareness. The fact that the two groups of youth did not differ significantly on the subscale of emotional awareness was consistent with our hypothesis that both of these groups may struggle with awareness of their own emotions. Taken in combination with the other findings of this study, one possible explanation may be that there are different mechanisms underlying the lack of emotional awareness for youth in the primary and secondary groups. Primary CU is theorized to be related to an inherent deficit in emotional processing, which may even be related to

neuropsychological differences such as reduced amygdala activation to distress cues and impaired connectivity between the amygdala and ventromedial prefrontal cortex (Marsh et al., 2008). Whereas those differences have been observed in studies of high-CU individuals' responses to others' distress cues, it is possible that individuals with primary CU traits have similar deficits in the awareness of their own emotional states. In contrast, different patterns likely are involved in the reduction in emotional awareness found among youth with secondary CU traits. If youth with secondary CU are aware of their emotions but are unclear about them and are unwilling to accept them, they may engage in effortful experiential avoidance strategies in order to distance themselves from their emotional experience. Experiential avoidance has been associated with PTSD (Kashdan, Morina, & Priebe, 2009; Marx & Sloan, 2005; Morina, Stangier, & Risch, 2008; Plumb, Orsillo, & Luterek, 2004) but to date has not been investigated in relation to CU in the aftermath of trauma. Another related construct may be dissociation, which may provide secondary CU youth with a mechanism for separating their emotional experiences from direct awareness. For example, Tatar and colleagues (2012) found that adolescents with secondary CU were nearly 2.5 times more likely to report a dissociative experience than were youth with primary CU. Given these findings, future research would benefit from further exploring the roles of experiential avoidance and dissociation in the development of secondary CU.

The difficulties in emotion regulation found in the present study comparing primary and secondary variants of CU hold a number of implications for understanding how emotion regulation is associated with delinquency. Emotion dysregulation may influence delinquency directly through increasing reactive aggression, as has been suggested for secondary CU youth (Kimonis et al., 2011), or indirectly, through

impairing relationships with others and increasing impulsivity (Frick et al., 2003; Frick & Morris, 2004; Moffitt, 1993). Emotion dysregulation also serves to maintain symptoms of PTSD among those youth in the secondary CU group. Youth with PTSD may perceive their own emotional states to be overwhelming and therefore may be motivated to avoid stimuli that elicit emotional responses (Tull et al., 2007). In turn, because PTSD has been linked to increased recidivism for some youth (Becker et al., 2011), the maintenance of PTSD for secondary CU youth may also maintain patterns of delinquency. This conceptualization of the role of emotion dysregulation in PTSD is consistent with Horowitz's (2011) work, which suggested that dysregulated emotion is the product of attempts to reach an emotional equilibrium between symptoms such as re-experiencing and numbing of emotional responses. The current study expands the conceptualization of PTSD as a disorder of emotion dysregulation by relating difficulties with regulation to delinquency among adolescents.

Limitations to the current study include that all data were self-reported and collected cross-sectionally. In order to address these limitations, future research should include multiple reporters where possible and consider collecting data across multiple time points to better investigate how relations among variables may be changing over time. Self-report methodology addressing CU traits is inherently limited, given that psychopathy is associated with a tendency to manipulate others (Cleckley, 1941). However, although controversial, some studies to date have suggested that CU traits can be reliably self-reported because by nature CU traits represent internal states that cannot be easily observed by others (Lilienfeld & Fowler, 2006). Another potential limitation associated with self-report is that secondary CU youth may mask their distress through emotional detachment, thus self-reporting inaccurately (Kalisch et al., 2005).

Physiological measurements, largely unsusceptible to impression management, have the potential to detect whether or not secondary CU youth are truly “callous” under the surface, and future studies would benefit from including psychophysiological indicators in addition to self-report.

Despite the aforementioned limitations, the current study has a number of strengths that contribute to the literature on secondary CU traits, PTSD, and emotion dysregulation. First, this study is among the first to distinguish primary and secondary CU traits in a sample including both detained boys and girls. Because previous studies have suggested a stronger link between trauma and delinquency for girls than boys (Kerig & Becker, 2010), use of a mixed-gender sample allows for a broader understanding of the interrelations of these concepts among delinquent youth. Additionally, this is the first known study to examine emotion dysregulation among primary and secondary groups of high-CU youth, combining the literature on PTSD as a disorder of emotion dysregulation with what is known about emotional deficits in high-CU individuals. The integration of these two literatures allows for a clearer understanding of the emotional functioning of the secondary CU group in particular. An additional original contribution of the current study is the use of PTSD symptoms to form the primary and secondary clusters of high-CU youth. Previous studies have generally used trait anxiety as the differentiating variable, despite mixed evidence of the association between CU and anxiety (Dolan & Rennie, 2007). It is possible that while a lack of anxiety is characteristic of classic psychopathy, it serves less well to distinguish between primary and secondary variants. In the current study, primary CU youth did not differ significantly from the comparison sample on a measure of anxiety, which further calls into question whether anxiety is an effective differentiator of the callous-unemotional subtype, especially among youth. The

use of PTSD symptoms as the differentiating variable in the current study is consistent with Porter's (1996) theory regarding the origins of secondary psychopathy and therefore may provide a better representation of primary and secondary CU traits. However, this methodology should be examined with additional samples.

Finally, the current study has a number of clinical implications. High-CU individuals are thought to commit the most serious, violent offenses, to respond poorly to treatment, and to be difficult to rehabilitate (Frick & Ellis, 1999; Hawes & Dadds, 2005; Kruh, Frick, & Clements, 2005). The risk faced by failing to differentiate between youth typologized as primary and secondary variants is that youth with high levels of psychological distress may be overlooked for treatment, and it is especially important for youth whose PTSD symptoms may be directly influencing recidivism (Becker et al., 2012). As these youth appear more callous over time, they may also appear more out of reach of treatment interventions (Frick, 2009). Therapeutic interventions may be most effective if they include a focus on the development of effective emotion regulation strategies after first working with youth to better identify, label, and differentiate between emotional responses.

In conclusion, the current study offers support for the presence of two distinct subgroups of juvenile justice-involved youth high in CU traits. These groups differ on measures of anxiety, PTSD symptoms, and aspects of emotion dysregulation, including lack of clarity and nonacceptance of emotional responses. Group differences in emotion dysregulation may be related to the process of emotional numbing in response to traumatic events. Consequently, these differences have implications for our understanding of secondary CU, the links between trauma and delinquency, and the clinical treatment of high-CU youth

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